

K-1436PC1

PATENT

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In the application of: Mehrotra et al.
Serial No. 10/606,482
Filed: June 26, 2003

RESPONSE TO FINAL OFFICE ACTION OF NOVEMBER 15, 2007

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Claim Listing of Pending Claims:

Claims 1-24 (Cancelled)

25. (Currently Amended) A heat treated ground ceramic cutting insert produced by the process comprising the steps of:

providing an uncoated ground ceramic cutting insert having at least a portion thereof being ground; and

heat treating the ground ceramic cutting insert at a temperature between ~~greater than 1400~~ about 1600 degrees Centigrade and about 2200 degrees Centigrade so as to form the heat treated ground ceramic cutting insert.

26. (Original) The cutting insert according to claim 25 wherein the process further includes the step of coating the heat treated ground ceramic cutting insert.

27. (Previously Presented) The cutting insert according to claim 25 wherein the process further includes the steps of:

forming a green ceramic cutting insert compact from a powder mixture;

sintering the green ceramic cutting insert compact so as to form a sintered unground ceramic cutting insert compact;

hot isostatically pressing the sintered unground ceramic cutting insert compact so as to form an uncoated unground ceramic cutting insert blank; and

grinding at least a portion of the uncoated unground ceramic cutting insert blank so as to form the uncoated ground ceramic cutting insert.

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28. (Previously Presented) The cutting insert according to claim 25 wherein the process further includes the steps of:

forming a green ceramic cutting insert compact from a powder mixture;

sintering the green ceramic cutting insert compact so as to form a sintered unground ceramic cutting insert compact; and

grinding at least a portion of the uncoated unground ceramic cutting insert blank so as to form the uncoated ground ceramic cutting insert.

29. (Previously Presented) The cutting insert according to claim 27 wherein the powder mixture comprises about 14.2 weight percent zirconia; about 2.3 weight percent MgAl_2O_4 ; about 1.2 weight percent silicon carbide whiskers; about 0.14 weight percent silicon dioxide; about 0.02 weight percent calcium oxide; and the balance alumina.

30. (Previously Presented) The cutting insert according to claim 25 wherein the powder mixture comprises between about 60 weight percent and about 98 weight percent silicon nitride, up to about 12 weight percent aluminum nitride, up to about 25 weight percent alumina, up to about 2 weight percent magnesia, and up to about 7 weight percent yttria.

31. (Previously Presented) The cutting insert according to claim 25 wherein the process further includes the steps of:

forming a green ceramic cutting insert compact from a powder mixture;

uniaxially hot pressing the green ceramic cutting insert compact so as to form a hot pressed unground ceramic cutting insert compact; and

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grinding at least a portion of the hot pressed unground ceramic cutting insert compact so as to form the uncoated ground ceramic cutting insert.

32. (Previously Presented) The cutting insert according to claim 31 wherein the powder mixture comprises alumina and silicon carbide whiskers.

33. (Previously Presented) The cutting insert according to claim 32 wherein the powder mixture further includes zirconia.

34. (Previously Presented) The cutting insert according to claim 32 wherein the powder mixture further includes titanium carbonitride.

Claims 35-54 (Cancelled)

55. (Previously Presented) A heat treated ground ceramic cutting insert produced by the process comprising the steps of:

forming a green ceramic cutting insert compact from a powder mixture wherein the powder mixture comprises about 14.2 weight percent zirconia; about 2.3 weight percent MgAl_2O_4 ; about 1.2 weight percent silicon carbide whiskers; about 0.14 weight percent silicon dioxide; about 0.02 weight percent calcium oxide; and the balance alumina;

sintering the green ceramic cutting insert compact so as to form a sintered unground ceramic cutting insert compact;

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hot isostatically pressing the sintered unground ceramic cutting insert compact so as to form an uncoated unground ceramic cutting insert blank; and

grinding at least a portion of the uncoated unground ceramic cutting insert blank so as to form the uncoated ground ceramic cutting insert;

providing an uncoated ground ceramic cutting insert having at least a portion thereof being ground; and

heat treating the ground ceramic cutting insert at a temperature between about 1300 degrees Centigrade and about 2200 degrees Centigrade so as to form the heat treated ground ceramic cutting insert.

56. (Previously Presented) The cutting insert according to claim 30 wherein the heat treating step occurs at a temperature between about 1600 degrees Centigrade and about 2200 degrees Centigrade.

57. (Previously Presented) The cutting insert according to claim 31 wherein the powder mixture comprises between about 30 weight percent and about 40 weight percent alumina, between about 15 weight percent and about 25 weight percent silicon carbide whiskers and between about 35 weight percent and about 55 weight percent titanium carbonitride, and wherein the titanium carbonitride content is greater than the alumina content.